04 12 57 28	CC	Apollo 8, Houston.
04 12 57 32	LMP	Go ahead, Mike.
04 12 57 34	CC	Roger, Bill. Because of this W-matrix thing, we would like to add some more star sightings when Jim gets through with the series that he is currently on. And I have the information relevant to them when you are ready to copy.
04 12 57 53	LMP	Stand by.
04 12 58 00	LMP	Go ahead.
04 12 58 02	CC	Okay. This is - we would like him to do them, as I say, whenever he is through the series he is on now, and they are the same ones that are printed on your flight plan page 2-86. The first one we'd like to increase to two sets; the second one we'd like to increase to two sets, making a total of five sets on those stars on page 2-86. Do you copy?
04 12 58 34	LMP	Roger.
04 12 58 44	CC	Okay. The other change is on an elapsed time of 120 - a hundred and twenty hours: we'd like to increase that P23 work, the first star change, from one set to two sets. The second star from one to two - -
04 12 59 07	LMP	Wait a minute, wait a minute.
04 12 59 08	CC	Okay.
04 12 59 12	LMP	Okay. Looking for the page; I got it now.

04 12 59 16	CC	Okay. The first star, make two sets; second star, two sets; for a total of five sets.
04 12 59 25	LMP	Okay.
04 12 59 27	CC	And if you're in a copying mood, I have - would you believe - a couple of changes to your entry checklist which I'd like to read up to you sometime today or tomorrow.
04 12 59 43	LMP	Okay. Why don't we get them here after this one set of stars.
04 12 59 46	CC	Very good.
04 13 00 01	CC	Roger, Bill. I was just given a new one here. While you've got your flight plan out, this would be 130 hours CET. Have you got that page?
04 13 00 15	LMP	I just put it away, but I'll get it out again.
04 13 00 17	CC	I'm sorry about that.
04 13 00 24	LMP	... if you want me.
04 13 00 33	CC	Roger. At 130 hours GET, star 02: where it is printed two sets, we'd like to make that only one set; and then we would like to add star 11 (star one - one) lunar far horizon, two sets. Over.
04 13 01 05	LMP	Okay.
04 13 01 08	CMP	Hey, Mike. Is MIT slipping in the back door?
04 13 01 14	CC	Not really, Jim. It has to do with this W-matrix. You remember that we reinitialized it in lunar orbit, and then we worked on it as you came back

		on the previous sightings you made, and now we've gone on reinitialized it again at this point. And we'd like to restore it to its former size and shape and whatnot.
04 13 01 40	CMP	Okay. I understand.
04 13 12 12	CMP	Houston, Apollo 8.
04 13 12 15	CC	Go ahead, Jim.
04 13 12 20	LMP	Mike, I have got the entry checklist right now. You want to give me an update?
04 13 12 24	CC	Okay, Bill. Thank you. The first one is on page E-7.
04 13 12 32	LMP	Okay. Stand by.
04 13 13 08	LMP	Okay, Mike. Ready to go. Now I know why Neil was over there.
04 13 13 14	CC	No. You can't blame it on him. Page E-7 under CM RCS preheat, halfway down where it says "UP TELEMETRY BLOCK" - Are you with me?
04 13 13 31	LMP	I am with you.
04 13 13 33	CC	Okay. After UP TELEMETRY BLOCK, insert "RCS CM heaters circuit breakers to CLOSE."
04 13 13 58	LMP	Okay.
04 13 14 00	CC	All they are doing there is just making sure you get your heater circuit breakers closed. The next one is on page E-9.
04 13 14 25	LMP	Ready to copy.
04 13 14 27	CC	Roger. On E-9 up near the top under "terminate CM RCS preheat" and the middle there, after

		"CM RCS heaters OFF, LMP confirm," insert "RCS CM heaters circuit breakers to OPEN." That's just opening those two breakers back up.
04 13 14 54	LMP	Roger.
04 13 14 56	CC	And the last change is on page 14.
04 13 15 20	LMP	Okay.
04 13 15 22	CC	Yes. This one should be a favorite of yours. Near the top where it says "tape recorder, RECORD FORWARD" - Are you with me?
04 13 15 35	LMP	Roger.
04 13 15 36	CC	Insert between "tape recorder" and "RECORD FORWARD," insert "COMMAND RESET high bit rate." Over.
04 13 16 08	LMP	Okay. We got them.
04 13 16 10	CC	Thank you, Bill. That's all.
04 13 16 14	LMP	Okay, Michael.
04 13 16 24	CC	How is it going? Do you want any systems dope?
04 13 16 29	LMP	Yes, they are hanging together. I haven't even looked at them for the last half hour. I have been over here in the sun.
04 13 16 35	CC	Yes, they sure are, Bill. They can get you any specific numbers, whatnot, if you're interested.
04 13 16 50	LMP	Well, I hate to say I wasn't interested, but I don't need any specific numbers right now.
04 13 16 56	CC	Okay. Very good. We concur.
04 13 17 03	CC	That's an outer space first.

04 13 17 10	LMP	On second thought, how's the evaporator outlet TEMP doing?
04 13 17 25	CC	Forty-six degrees, Bill.
04 13 17 31	LMP	Cancel that outer space first.
04 13 17 35	CC	Roger.
04 13 17 49	CC	How's Magellan coming along?
04 13 17 55	CMP	I am getting a crossed eye looking at this thing. Hey, Mike, just as a matter of interest, I have been just looking at the earth the last hour and a half and there are two tremendous storms down there. I am not sure just where they are, but the vortices are huge.
04 13 18 14	CC	Roger. Understand.
04 13 18 15	LMP	That's your first space weather report at the manned weather forecast from space, and he's not so sure where it's raining, but it is raining somewhere.
04 13 18 26	CC	Roger - -
04 13 18 27	CMP	I'd also like to point out that Magellan is not a good analogy. I would also like to point out that Magellan is not a good analogy. I don't think he made it around.
04 13 18 36	CC	Very good.
04 13 18 39	CMP	How about Alford Chitister?
04 13 18 44	CC	Roger. Alf.
04 13 19 27	CC	I don't know how much detail you can see, Jim, but your subspacecraft point is out in the

middle of the Pacific Ocean about halfway between Australia and South America.

04 13 19 45 CMP Roger. The next time I take a look, I'll see what I - we are maneuver to the moon now. We'll see if we can see our shadow.

04 13 20 06 LMP Seriously, has anyone been able to see the spacecraft from earth? Optically?

04 13 20 18 CC We don't think so, Bill. We haven't been able to confirm that they have.

04 13 20 26 LMP Okay.

04 13 20 33 CC You are coming right down the center line of the airways. If you see the airliners going the other way, you better move over.

04 13 20 42 LMP That's the first time old Lovell's been on track for a long time.

04 13 20 48 CC Roger.

04 13 20 53 LMP Mike, an interesting viewpoint of the NAV sightings: maneuvering with the minimum impulse controller on the way home is a lot more difficult than going out because of all the fuel we don't have now. Every little pulse really moves the spacecraft around.

04 13 21 08 CC Roger. Understand you have too much control for you.

04 13 21 14 LMP Now, yes.

04 13 21 19 CMP Let Bruce beware.

04 13 23 48	CC	Apollo 8, Houston.
04 13 23 52	CMP	Go ahead.
04 13 23 54	CC	Howdy, Jim. Dick Underwood is over here. They're getting their film processing all prepared for your film when you get back and tentatively, can you give us some idea of how much you exposed?
04 13 24 08	CMP	Let me - - let me introduce you to the great film man. He will tell you all about it.
04 13 24 12	CC	Thank you.
04 13 24 15	LMP	Tell him I hope he can account for haze through the windows. We - on our departure from the moon, we tried to burn up as much as - much of what we had left over, which was quite a bit, and tell him I hope he can develop the high-speed film taken at normal film settings.
04 13 24 47	CC	Roger. Understand you used just about everything and a lot of the high speed; you used it to normal setting.
04 13 24 56	LMP	Roger. We got it in the wrong bucket there a couple of times.
04 13 24 59	CC	Okay.
04 13 25 06	LMP	We never did have a chance to do anytnight earthshine stuff.
04 13 25 14	CC	Say again about the earthshine, Bill.
04 13 25 18	LMP	We never did have a chance to do any earthshine photography.

04 13 25 21 CC Roger. Understand.

END OF TAPE

APOLLO 8 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

04 01 55 51	CC	Apollo 8, Houston.
04 01 55 57	CMP	Go ahead.
04 01 56 00	CC	Apollo 8, Houston. How are you coming along with your P23 marks?
04 01 56 06	CMP	My eyeballs are getting square. That's what we have been doing most of the day, Ken. Are you receiving the data down below?
04 01 56 20	CC	Roger. Looks like you are getting some pretty good marks. We have a pretty good hack on the vector and the matrix, and looks like if you wanted to terminate at this point, that we do have good data.
04 01 56 38	CMP	Sounds good. I'll terminate after his - -
04 01 56 41	CC	Roger.
04 01 56 43	CMP	- - trying to do star 01 again.
04 01 56 44	CC	Roger.
04 01 59 20	CMP	Ken, did you have a nice Christmas?
04 01 59 31	CC	Apollo 8, Houston. Did you call?
04 14 15 52	LMP	Houston, Apollo 8.
04 14 16 07	LMP	Houston, Apollo 8. Over.
04 14 16 10	CC	Go ahead, Apollo 8.
04 14 16 17	LMP	Who is this, Ken or Jerry?
04 14 16 20	CC	Say again, please.
04 14 16 24	LMP	This Ken?
04 14 16 29	CC	Here's Ken. Go ahead.

04 14 16 35	LMP	Okay, Ken. We are getting back to the PTC attitude. Would you like us to do this high-gain REACQ test now on the first roll?
04 14 16 42	CC	Affirmative.
04 14 16 55	LMP	Okay. Look, how about if I just went to REACQ right now?
04 14 17 28	LMP	Matter of fact I'm in REACQ. If you want me to stay here, why we'll just press on.
04 14 17 40	CC	Okay, Apollo 8. That is fine.
04 14 17 44	LMP	I guess this step about stopping in roll 150 really doesn't matter too much then.
04 14 18 10	CC	That's right, Bill. That was just to let you acquire.
04 14 18 17	LMP	Man, we can acquire on the run here.
04 14 18 21	CC	Hey, you are getting good at that.
04 14 18 25	LMP	That's all they'll let me do.
04 14 18 30	LMP	Okay. We will keep it here for two REV's, Ken. Frank and - Frank and Jim are asleep, and ... so I'll just keep it going here for two rolls.
04 14 18 44	CC	Okay. Real fine.
04 14 35 59	LMP	Houston, Apollo 8. Over.
04 14 36 02	CC	Go ahead, 8.
04 14 36 14	CC	Go ahead, 8.
04 14 36 19	LMP	Well, the REACQ didn't work as advertised. It looked like it went on by the scan limit and into the mechanical limit and followed MSFN around looking out of the corner of its eye

on WIDE BEAM. And when MSFN came back underneath the spacecraft, why it snapped back on it to NARROW BEAM. It apparently never broke lock; or if it did, it was only instantaneously.

04 14 36 56 CC Roger. It looked like we did break lock there for about 8 minutes.

04 14 37 05 LMP Well, we might have broken two way lock, but I was still having about AGC right at the noise level, at the minimum reception level.

04 14 37 17 CC Roger.

04 14 37 30 LMP When we get out here in the clear zone, when we're definitely out of the scan limit, why, I'll go ahead and go to the MANUAL and AUTO lock-on sequence and switch over to REACQ and see what it does next time around.

04 14 37 43 CC Roger.

04 14 38 06 LMP Houston. Were you able to get high bit rate from the OMNI's now, by the way?

04 14 39 21 CC Apollo 8, Houston. The OMNI high bit rate capability is noisy, but usable.

04 14 39 31 LMP Okay. I think what we'll do here is, if I see the high gain definitely going past the scan limit before it gets the mechanical limit, I'll go ahead and ask - you could ask if the REACQ feature hasn't taken over I'll just go ahead and shut it down so that it'll remain in stops.

04 14 40 00	LMP	How's that sound?
04 14 40 01	CC	We are talking about it now, Bill.
04 14 40 05	LMP	Okay. It's my understanding that the scan warning limit of this thing is supposed to stop tracking; and break of lock, it'll travel on over to the thumb-wheel settings.
04 14 40 28	CC	Roger. That's my understanding, Bill. We are talking about it right now. I'll let you know in just a second.
04 14 40 33	LMP	Probably, Ken, we are not ever losing the earth's present signal.
04 14 40 38	CC	That's correct.
04 14 42 01	CC	Hey, Bill, can you tell us what angles this went through? The curve that we have plotted is apparently the RF limit rather than the mechanical limit; and discussing the function of the AUTO REACQ mode, it looks like it is supposed to shift when it hits the RF limit, which is your - should be your ENTER set of numbers as opposed to the scan warning limit. And if it went inside of that number, could you tell us about what kind of numbers it did go to?
04 14 42 35	LMP	Roger. It went past the caution warning limit to the scan or RF limit, as I understand it. And let me give you a rundown on what it did here.

04 14 42 44	CC	Okay. Say it slow so I can copy it.
04 14 42 50	LMP	Okay. The antenna went to about 330 to 270 yaw, plus 60 to 80 pitch. Copy?
04 14 43 15	CC	Roger.
04 14 43 19	LMP	Okay. The AGC dropped off to what I call our noise level, that was the voltage level on the AGC measured at - integrated when the noise broke in. It was about 11 o'clock position on the gage, and it looked like it was switching beam widths there off and on. It would pulse up and down, and a couple of times dropped to full-scale low very briefly.
04 14 43 52	CC	Okay. You got some marks on that AGC that should register in volts, I believe. Do you have an indication other than 11 o'clock?
04 14 44 06	LMP	Unfortunetely, the numbers never got on here. If you will look on that chart that Fred Haise has, it shows one at 11 o'clock position which is the noise level. I don't remember what the voltage was. I might have it on my systems book, though.
04 14 44 24	CC	Bill, - -
04 14 44 25	LMP	When the antenna - when the antenna did snap back in, it went to yaw 80, pitch minus 5, with VERB 64 reading plus 67 for yaw and minus 10 for pitch.

04 14 44 45	CC	Okay. Yes, copy all that. I think you have four or five marks on that power meter, don't you? From what you are saying, I take it, it's between marks 2 and 4.
04 14 45 01	LMP	Yes. Stand by a second.
04 14 45 15	LMP	Stand by, Ken. I'll tell you what that mode is.
04 14 45 18	CC	Thank you.
04 14 45 50	LMP	Okay. It went to about - hovering around 2.4 to 3 volts.
04 14 45 57	CC	Okay. Thank you.
04 14 46 02	LMP	Closer to 2.4.
04 14 46 03	CC	Roger.
04 14 50 11	CC	Apollo 8, Houston.
04 14 50 15	LMP	Go ahead.
04 14 50 19	CC	Okay. It's not real clear that it did, in fact, get to the mechanical stop, and if it does, the back room people say we can stay up against that stop for a maximum of 15 minutes without doing any damage. And we would kind of like to track it through one more time as is. We do have the high bit rate capability on OMNI's. So we would like to follow through that same configuration for one more REV.
04 14 50 55	LMP	Stand by.
04 14 51 08	LMP	Well, since we are not sure that it did get up against the mechanical stop last time for

		10 minutes or so, I don't think it would be too smart to do it this time because we may end up having to switch field to high gain position.
04 14 51 32	CC	I am sorry, Bill. You didn't come through. Say again, please.
04 14 51 38	LMP	Since we are not - it is not clear to me that we weren't up against mechanical stops for a while on the last time around. That might account for 10 minutes of that 15 minutes, and there is no sense pushing our luck. I think we ought to - if it starts dropping off again, we just ought to go and put it back into MANUAL and take it back where it belongs. We are still a long way from home, and if that antenna switch fails, it's going to fail the high-gain position, and that's all we got.
04 14 52 18	CC	Roger, Bill. And we will be making a handoff on stations at 5:5.
04 14 52 27	LMP	Okay.
04 14 53 39	LMP	Ken, we are going to switch COMM carriers here a second.
04 14 53 42	CC	Okay, thank you.
04 14 53 52	LMP	Belay that. We'll hold this configuration for a while.
04 14 53 55	CC	Okay.
04 14 56 03	CC	Apollo 8, Houston through Honeysuckle.

04 14 56 10	LMP	Roger. Read you five-by.
04 14 56 12	CC	Thank you.
04 15 07 24	LMP	Houston, Apollo 8. Over.
04 15 07 27	CC	Loud and clear, Apollo 8.
04 15 07 32	LMP	It did the same thing that time, Ken. This time the voltage AGC did drop to full-scale low for several seconds, but the antenna does seem to have the capabilities to look right through the spacecraft, and I guarantee, the earth went where the antenna was not supposed to be able to go.
04 15 07 53	CC	Okay. I would just like to confirm with you that it never did go back to the present numbers.
04 15 08 02	LMP	No, it apparently never lost earth presence signal. It sounds like it was trying to pick up one-way lock all the time, and we usually hovered around 2-volts AGC except for brief periods.
04 15 08 17	CC	Okay. Thank you very much.
04 15 08 21	LMP	It looks like if they had - should have not had the ... switch into WIDE BEAM until after it had gone to those preset limits.
04 15 09 04	LMP	We are back in AUTO on the OMNI.
04 15 09 06	CC	Okay. Thank you.
04 15 12 59	LMP	Houston, CDR is up and manning the helms. We are going to switch COMM carriers. We'll be off the air for a little bit.

04 15 13 04 CC Okay. Thank you.

END OF TAPE

APOLLO 8 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

04 15 16 24	CDR	Hey, Ken. This is Frank.
04 15 16 26	CC	Good morning, sir.
04 15 17 01	CDR	Houston, Apollo 8.
04 15 17 03	CC	Go ahead, Apollo 8. Loud and clear.
04 15 17 08	CDR	How far are we from home, Ken?
04 15 17 10	CC	Oh, about 152, looks like. That's pretty gross; I get you a real number in just a minute.
04 15 17 17	CDR	152?
04 15 17 37	CC	148 550; that's a good number.
04 15 17 44	CDR	Very good.
04 15 17 58	CC	And your velocity is about 4650.
04 15 18 07	CDR	Increasing, huh?
04 15 18 09	CC	That's affirm.
04 15 31 21	LMP	Houston, Apollo 8.
04 15 31 23	CC	Go ahead, Apollo 8.
04 15 31 26	LMP	We are trying to get back on our normal sleep cycle, and I just woke up here a little while ago, so I'm going to try to hit the hay again. It'd probably be a good idea to try another Seconal to try to get with it. What do you guys think down there?
04 15 31 46	CC	Okay. Sounds like a good idea, and if we can get Frank to tell us how much sack time he got, why that'll go in the log, too.
04 15 32 04	CDR	I was in bed for 7 hours, Ken, and I probably slept for about 4-1/2 to 5 hours of it, anyway.

04 15 32 10	CC	You're getting better. Good.
04 15 32 53	CDR	If you - if you're interested in further reports, we've all had three meals today, and we have drunk a lot of water, and Jim's asleep now. He worked pretty hard this afternoon, but I think we are all in pretty good shape now.
04 15 33 06	CC	Real fine. Thank you.
04 15 33 11	CDR	Used the exerciser.
04 15 34 10	CDR	Well, Ken, that just leaves you or I - how about you and I - did anything exciting happen today?
04 15 34 16	CC	I think you know about all the things that are exciting up on your end, and it's real quiet down here. Everybody is smiling; Santa was good to most of the folks in the world, and everything is pretty calm, like it should be on Christmas.
04 15 34 35	CDR	Very good.
04 15 34 42	CC	Milt says we're in a period of relaxed vigilance.
04 15 34 46	CDR	Very good.
04 15 34 51	CDR	We'll relax; you be vigilant.
04 15 34 54	CC	That's a fair trade. (Laughter)
04 15 37 24	CDR	Hey, Ken, has anybody got any good idea why that quad A tank is running hot, hotter than the rest by so much?
04 15 37 34	CC	Okay. I didn't have an answer when I came on; just a second and we'll check again.
04 15 39 44	CC	Apollo 8, Houston.
04 15 39 49	CDR	Go ahead, Houston.

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04 15 39 52	CC	Okay, Apollo 8. Let me tell you what the subjects are that we're going over down here: number one, we're making a review of all the entry procedures and this type of information, and we're going to actually go through and review the entry checklist. We have people that are still working on verification of your erasable memory, and we are looking at the EMS problem, and we're discussing the quad temperature, so I'll feed up some of these pieces of information as they come along, and right now we are just sort of having a status review.
04 15 40 34	CDR	I don't think the EMS is much of a problem; it just jumps when you go into AUTO. I don't believe it will bother us for entry. I - I'm doing the same thing; I am looking over my entry checklist. One of the first things I see here is a coldsoak, and I don't think we want to evaporate between the last midcourse and entry, do we?
04 15 55 27	CC	Apollo 8, Houston.
04 16 09 33	CC	Apollo 8, Houston.
04 16 09 56	CC	Apollo 8, Houston.
04 16 10 00	CDR	Go ahead, Houston. Apollo 8.
04 16 10 03	CC	Roger. Looking at the flight plan, you have a P52 coming up at a 115 hours, and we'll have to do another one at 119:45 in preparation for the P23.

And it's acceptable with the ground procedures if you would like to delay about 115-hour alignment, and do it just once at 119:45, or you can do it there in flight plan location. If you want to skip the 115-hour alignment we could go ahead and start in on the pitch and yaw free PTC mode at this time.

04 16 10 48	CDR	What does that mean, Ken?
04 16 10 54	CC	Okay. We have a DTO that requires that we do a PTC and go ahead and do it in minimum impulse mode so that we're not putting any attitude hold corrections in. And we're going to be tracking the attitude excursion, and they want this somethink like 6 hours - or until we reach a limit.
04 16 11 19	CDR	Okay.
04 16 11 30	CDR	Cabin's running a little bit warmer today than normal.
04 16 11 35	CC	I'm sorry; say it again.
04 16 11 38	CDR	I say the cabin is running a little bit hotter today than it has been. It looks like this particular PTC alignment gets more sun in the cabin than the PTC before.
04 16 11 51	CC	Roger. What kind of temperature are you recording now?
04 16 11 56	CDR	About 78.
04 16 12 04	CDR	I just put the window shades up. That'll cool it down.

04 16 12 07	CC	Okay.
04 16 12 12	CDR	Do you want me to take the pitch yaw out of RATE COMMAND, right?
04 16 12 20	CC	That's affirmative. You just put it MINIMUM IMPULSE, and then we'll watch it.
04 16 12 34	CDR	There you are.
04 16 12 36	CC	Okay. Thank you.
04 16 12 38	CDR	Have fun.
04 16 12 41	CC	Roger. And on that quad temperature - the upper limit of that thing is 105 degrees on the bottle. You are well below that. We have been watching it, and it is tracking, although it is tracking very slowly. As you roll the spacecraft, the temperature excursions seem to be a little sluggish, but it isn't a frozen sensor. And talking a little bit more about that one right now, you might tell Jim the next time he goes to work with the optics, when he works with the trunnion, if he'll go ahead and recycle the ZERO OPTICS switch, he can avoid the problem we had prior to midcourse correction 4.
04 16 13 24	CDR	We've done that. And the midcourse correction 4 - -
04 16 13 25	CC	Roger.
04 16 13 26	CDR	- - the midcourse correction number 6 right now looks like zero, and midcourse correction number 7 is approximately 2 feet per second.

04 16 13 38	CDR	Okay, Jim. Now we've got on the checklist to initiate cabin coldsoak. This involves evaporating, and I don't think we want to do that.
04 16 13 48	CC	Okay. Now we talked that over with FIDO, and at 12 hours out, everyone seems to think that we don't need to do it there. But in close, it doesn't seem to have any effect on the trajectory, and what's been suggested if you'd like - we can go over the entry checklist and just kind of walk through it on the air with all the people on the console. Right now, you have the team that will be performing the entry session with you so we can go over the checklist and run down any questions that you might have. That's up to you.
04 16 14 44	CDR	That's fine. Let's do that. I've got one right here. I'm lonesome anyway.
04 16 14 48	CC	Okay. Give us a few minutes to pull ourselves together and get on the air.
04 16 22 23	CC	Apollo 8, Houston.
04 16 22 28	CDR	Go ahead.
04 16 22 29	CC	Okay. We've drifted off now about 25 degrees in pitch. I'd like to have you take it back and set up the PTC plane again at pitch of 10 and yaw 45 and set up the PTC under control, and turn your pitch back to minimum impulse. And give us a mark when you have done that, and we'll time the drift rates down here.

04 16 22 56	CDR	Okay.
04 16 25 01	CDR	Okay, Ken. I've got them all damped out about as low as I can get them.
04 16 25 05	CC	Okay. Fine.
04 16 25 08	CDR	I'll put in a roll right now.
04 16 25 10	CC	Thank you.
04 16 25 14	CDR	It takes me three actuations to get about - just about a degree and a half, or a tenth of a de - 0.15 degrees per second.
04 16 25 23	CC	Okay. And give a mark when you release the RATE COMMAND in pitch and yaw.
04 16 25 31	CDR	I haven't even got them on.
04 16 25 33	CC	Oh, okay. Fine.
04 16 25 35	CDR	When I gave you - when I gave you that mark, that was it.
04 16 25 38	CC	Real fine. Thank you.
04 16 25 57	CDR	It's much more sensitive today than it was when it was heavy.
04 16 26 01	CC	Roger.
04 16 26 18	CDR	Well, the old earth is getting bigger.
04 16 26 20	CC	Good show. Going in the right direction, then.
04 16 26 25	CDR	Yes. I was beginning to get worried.
04 16 27 38	CDR	Ken, be sure and call me if you see the gimbal angles start to get near gimbal arc or anything. I'm a little drowsy still. I don't want to end up with another null attitude, like one is enough.
04 16 27 50	CC	Roger. Will do.

04 16 42 57	CC	Apollo 8, Houston.
04 16 43 00	CDR	Go ahead, Ken.
04 16 43 01	CC	Okay. Would you reinitialize the PTC attitude, and let's try that one more time.
04 16 43 09	CDR	Okay.
04 16 45 22	CDR	You re_dy?
04 16 45 23	CC	Okay.
04 16 45 24	CDR	Okay. Three blips.
04 16 45 25	CC	Thank you.
04 16 45 33	CDR	There she goes.
04 16 45 35	CC	Roger.
04 16 45 52	CDR	Is it sleepy out down there, too?
04 16 45 54	CC	Say again, please.
04 16 45 58	CDR	I say, is it sleepy out down there?
04 16 46 02	CC	Roger. It's getting pretty good now. I figure it's getting sleepy up there, though.
04 16 46 08	CDR	Yes.
04 16 46 11	CC	Okay. Well would you believe that the North beat the South 3 to nothing, and they did that all with a first-quarter field goal.
04 16 46 24	CDR	Very good. When was the East-West game?
04 16 46 31	CC	Oh, about Saturday.
04 16 46 36	CDR	Next Saturday?
04 16 46 37	CC	Yes, sir.
04 16 46 51	CC	And, Frank, we are going over the checklist right now, and I'll get back with you on the entry checklist in a few more minutes.